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March 2017

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Economic Development, Democratic Institutions, and Repression in Non-democratic Regimes: Theory and Evidence

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Abstract

This paper analyzes the utilization of repression and democratic institutions by a non-democratic government striving for political power and private rents. We find that economic development has different impacts on policy choices, depending on whether it appears in the form of rises in income or in education: A higher income level reduces democracy, whereas more education leads to both more democracy and more repression. These theoretical findings are corroborated by panel data regressions.

JEL classification: C33; D72; K38; H11; O10

Keywords: Modernization Theory; Democracy; Repression; Non-democratic Government

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1 Introduction

Lipset's (1959) modernization theory, positing that economic development induces and consolidates democracy, has undergone massive scrutiny in recent literature (e.g. Acemoglu et al., 2008; Benhabib et al., 2013; Heid et al., 2012; Moral-Benito and Bartolucci, 2012). Matters are particularly controversial for countries with low democracy levels whose regimes are usually found to be stabilized by growing per capita incomes (e.g. Ulfelder, 2007). Moreover, there is evidence that non-democratic leaders secure office not only by relying on repression but also by implementing some democratic institutions (Gandhi and Przeworski, 2007).

Building on these observations, we provide a detailed analysis of the utilization of both democratic institutions and repression by non-democratic governments. We adopt an elaborate view on modernization by disentangling income and education as different facets of economic development. This matters because non-democratic leaders react to rises in income and education in different ways: A higher level of education leads to more democracy and more repression, whereas rises in income dismantle democratic structures. Derived theoretically in Section 2, these results are corroborated in Section 3 by panel data regressions for several indicators of democracy and human rights violations.

2 The Model

Consider a non-democratic leader L in the spirit of Wintrobe (1990), deriving utility from political power p and private consumption c:

$$U_L = u(p) + v(c), \tag{1}$$

where $u(\cdot)$ and $v(\cdot)$ are well-behaved concave functions ($u' > 0 > u'', v' > 0 > v''$) ensuring interior solutions for the sake of convenience.

L raises a budget B by taxing income y at rate τ, leaving the population with net income $(1-\tau)y$.[1] The relation between tax rate and revenues is of a Laffer-type: $B = q(\tau) \cdot y$ with $q'(0) \in (0, 1]$, $q''(\tau) < 0$, and $q'(\hat{\tau}) = 0, \hat{\tau} \leq 1$.

Political power p is measured by the extent to which L can act at her own discretion. Obviously, p is inversely related to democracy due to institutional constraints arising from a constitution, an independent legislature, modes of political competition, etcetera. Denoting the level of democracy by $d \in [0, \bar{d}]$, with $\bar{d}$ as the maximum degree of democracy an autocratic regime can offer, we express political power as: $p = \bar{d} - d$.

L can lose office by a revolution only. The mobilization potential of insurgents increases in the dissatisfaction of the general population. The utility of the latter depends on economic

[1] We normalize population size to unity. Hence, y denotes both per capita and total income.

and political satisfaction according to:

$$U_P = w((1-\tau)y) + s(d-e),$$

where $w(\cdot)$ and $s(\cdot)$ are well-behaved concave functions ($w' > 0 > w'', s' > 0 > s''$). While economic satisfaction is driven by net income, political satisfaction depends on the difference between supply and demand for democracy. Consistent with Lipset (1959), the latter is represented by the level of education e, diminishing political satisfaction from a given democracy level.

Following Bar-El (2009), members of the general population are dissatisfied when L provides too low utility. Threshold utility levels being uniformly distributed in the interval $[\underline{U}, \overline{U}]$ with $\delta = \overline{U} - \underline{U}$, the dissatisfied share of the general population is:

$$N = 1 - \frac{w((1-\tau)y) + s(d-e) - \underline{U}}{\delta}. \tag{2}$$

In order to prevent the mobilization of N and maintain regime stability, L must exert repression. With ϕ as the per capita cost of containing the dissatisfied, repression expenditures amount to:

$$r = \phi \cdot N = \phi \left(1 - \frac{w((1-\tau)y) + s(d-e) - \underline{U}}{\delta}\right). \tag{3}$$

As $c = B - r$, these expenditures reduce L's private consumption.

Summing up, L chooses the level of democracy and the tax rate in order to maximize utility subject to the requirement that supporters of insurgents be controlled. Formally spoken:

$$\max_{d,\tau} u\left(\bar{d} - d\right) + v\left(q(\tau)y - r\right), \tag{4}$$

with r given by (3). Using $\varphi = \phi/\delta$ for notational brevity, first order conditions become:

$$d: \qquad -u'(\bar{d} - d) + v'(q(\tau)y - r) \cdot \varphi \cdot s'(d-e) = 0, \tag{5}$$

$$\tau: \qquad v'(q(\tau)y - r)[q'(\tau)y - \varphi \cdot w'((1-\tau)y) \cdot y] = 0. \tag{6}$$

Applying Cramers Rule yields:

$$\frac{\mathrm{d}d}{\mathrm{d}y} = -\frac{\varphi \cdot v''s' \cdot (q + \varphi \cdot w' \cdot (1-\tau))}{u'' + \varphi \cdot v's'' + \varphi^2 \cdot v''(s')^2} < 0, \tag{7}$$

$$\frac{\mathrm{d}\tau}{\mathrm{d}y} = \frac{\varphi \cdot w'' \cdot (1-\tau)}{q'' + \varphi \cdot w'' \cdot y} > 0, \tag{8}$$

$$\frac{\mathrm{d}d}{\mathrm{d}e} = \frac{\varphi^2 \cdot v''(s')^2 + \varphi \cdot v's''}{u'' + \varphi \cdot v's'' + \varphi^2 \cdot v''(s')^2} > 0, \tag{9}$$

$$\frac{\mathrm{d}\tau}{\mathrm{d}e} = 0. \tag{10}$$

A higher per capita income increases the tax rate and weakens democratic institutions, whereas a more educated population leads to more democracy without inducing tax rate

changes. Utilizing (7)-(9), we find that repression reacts ambiguously on y and increases in e:

$$\frac{\mathrm{d}r}{\mathrm{d}y} = -\varphi\left(w' \cdot \left(1-\tau-y\cdot\frac{\mathrm{d}\tau}{\mathrm{d}y}\right)+s'\cdot\frac{\mathrm{d}d}{\mathrm{d}y}\right) \tag{11}$$

$$= -\varphi\left(\frac{q''w'\cdot(1-\tau)}{q''+\varphi\cdot w''\cdot y}-\frac{\varphi\cdot v''(s')^2(q+\varphi\cdot w'\cdot(1-\tau))}{u''+\varphi\cdot v's''+\varphi^2\cdot v''(s')^2}\right)\gtrless 0, \tag{12}$$

$$\frac{\mathrm{d}r}{\mathrm{d}e} = \varphi\cdot s'\cdot\left(1-\frac{\mathrm{d}d}{\mathrm{d}e}\right)=\frac{\varphi\cdot s'u''}{u''+\varphi\cdot v's''+\varphi^2\cdot v''(s')^2}>0. \tag{13}$$

These findings have a plain interpretation. A higher per capita income diminishes economic dissatisfaction as the net income of the population grows ($\frac{\mathrm{d}(1-\tau)y}{\mathrm{d}y}=1-\tau-y\cdot\frac{\mathrm{d}\tau}{\mathrm{d}y}>0$). However, higher tax revenues ($\frac{\mathrm{d}B}{\mathrm{d}y}=q+q'\cdot\frac{\mathrm{d}\tau}{\mathrm{d}y}\cdot y>0$) spur L's demand for political power. The resulting dismantlement of democracy increases political dissatisfaction. Therefore, economic and political discontent move in opposite directions and the effect on overall dissatisfaction and hence on repression is ambiguous. In contrast, a higher education level definitely reinforces dissatisfaction. Minimizing utility losses by sacrificing both political power and private consumption, L increases democracy and repression.

We abstain from investigating the ambiguous relation between r and y explicitly.[2] Moreover, lacking data on tax rates prevent testing the effects of income and education on τ. Thus, the next section addresses the following hypotheses:

H_d^y: A higher per capita income is associated with a lower level of democracy.
H_d^e: A higher level of education is associated with a higher level of democracy.
H_r^e: A higher level of education is associated with a higher level of repression.

3 Empirical Evidence

We employ various measures of democracy and repression. Regarding the former, we take the "Polity scores", an aggregate democracy index ranging in discrete steps between -10 (full autocracy) and 10 (full democracy), as well as the concept variables "political competition", "executive constraints" and "executive recruitment" from the Polity IV dataset (Marshall and Gurr, 2016). Additionally, we consider the Freedom House Political Rights Index (FHPR) (Freedom House, 2016). Repression is measured by the "Amnesty scores" and the "State Department scores" of the Political Terror Scale (Gibney et al., 2016) as well as the "Physical Integrity Rights Index" of the CIRI Human Rights Data Project (Cingranelli et al., 2014). All indices are (re)coded such that higher values indicate higher levels of democracy and repression, respectively.

Income and education are operationalized by GDP per capita (in mil. 2011 US$ PPP) from the Penn World Table 9.0 (Feenstra et al., 2015) and the average years of schooling of the population aged 25 and over (Barro and Lee, 2013). As controls, we use data on natural resources rents and population density (World Bank, 2016), on ethnic and religious fractionalization (Alesina et al., 2003), and on the number of bordering countries and the

[2] Nevertheless, Table 1 reports regression results.

magnitudes of intrastate and interstate conflict (Marshall, 2016).

The sample is restricted to non-democracies, characterized by a "Polity score" of at most 5 in the respective year. This yields an unbalanced panel of 88 countries in the period from 1970 to 2014. We employ time period averages of 5 and 10 years as governments may adjust repression and democracy to changes in income and education with a time lag of unapparent length. Explanatory variables enter as arithmetic means. Dependent variables are ordinal. Thus, we apply their medians[3] and use (proportional odds) ordered logistic regression models with random effects specifying the probability of an outcome $y_{it} > k$ for country i in time period t as:[4]

$$\Pr(y_{it} > k|\boldsymbol{\kappa}, \boldsymbol{x}_{it}, v_i) = F(\boldsymbol{x}_{it}\boldsymbol{\beta} + v_i - \kappa_k). \tag{14}$$

Here, $\boldsymbol{x}$ and $\boldsymbol{\beta}$ denote explanatory variables and regression coefficients, respectively. $\kappa = \kappa_1, \kappa_2, \ldots, \kappa_K$ is a set of cutpoints for the K possible outcomes, $v_i \overset{\text{i.i.d.}}{\sim} N(0, \sigma^2)$ is a country-specific effect and $F(\cdot)$ denotes the logistic cumulative distribution function. We transform regression coefficients into odds ratios which indicate negative (positive) associations for values smaller (greater) than 1. GDP per capita, years of schooling, resources rents, and population density enter as logarithms to base 2. This accounts for their highly skewed distributions and allows the respective odds ratios to be interpreted as changes from doubling the value of these explanatory variables. Standard error estimators are specified as robust against heteroscedasticity and serial correlation within countries.

Table 1 shows the regression outcomes. For all democracy indicators, we find a negative relationship with GDP per capita (odds ratios smaller than 1). Except for the FHPR, these relationships are statistically significant, confirming hypothesis H_d^y. Estimated effect sizes vary across dependent variables. A particularly large negative effect of income arises for "political competition" in the 5-years sample where the odds of a higher score decline by more than 75 % when income doubles. A rise in average years of schooling, however, tends to go along with higher democracy scores. For all indicators, odds ratios are significant at the 1 % level and exceed 1, corroborating hypothesis H_d^e. Again, the effect is considerably large for "political competition" in the 5-years sample. Here, the odds of higher competition are predicted to increase by more than the 15-fold when years of schooling double. Interestingly, control variables show no conclusive pattern with respect to democracy levels.

Regarding repression, estimation results point to a positive association with education, clearly supporting hypothesis H_r^e. Once again, regression coefficients are statistically significant at the 1 % level. Doubling years of schooling is predicted to change the odds for a higher repression category by a factor between 1.84 and 4.89 ("Amnesty scores", 5-years sample and "State Department scores", 10-years sample, respectively). Regarding control variables, repression is found to be higher in countries with higher natural resources rents,

[3]To avoid the generation of intermediate categories with a small number of observations potentially leading to convergence problems in estimation, all non-integer median values are rounded up.

[4]Treating our dependent variables as continuous and applying fixed effects regression yields qualitatively similar results. Regression tables are available upon request.

population densities, magnitudes of intrastate conflict and many neighbors.

4 Conclusion

We provide theoretical and empirical evidence that non-democratic governments respond differently to economic development, depending on whether it appears in the form of increasing education or per capita income. To disentangle effects, we have abstracted from the impact of education on income and vice versa. Accounting for such interrelations would be a promising extension which we leave for future research.

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Table 1: Regression Results

Dependent variable	Political competition		Executive constraints		Executive recruitment		Polity scores	
Length of time period	5 years	10 years	5 years	10 years	5 years	10 years	5 years	10 years
log(GDP per capita)	0.238***	0.430***	0.622*	0.670**	0.477***	0.470***	0.439***	0.513***
	(0.068)	(0.087)	(0.167)	(0.135)	(0.115)	(0.116)	(0.102)	(0.089)
log(Years of schooling)	15.500***	6.233***	5.302***	4.140***	3.453***	2.638***	7.392***	4.795***
	(6.561)	(1.954)	(1.717)	(1.057)	(1.038)	(0.609)	(1.932)	(1.066)
log(Resources rents)	1.272*	1.066	1.016	0.973	0.948	0.969	1.033	0.946
	(0.162)	(0.077)	(0.085)	(0.069)	(0.130)	(0.129)	(0.099)	(0.073)
log(Population density)	2.252***	1.458***	1.318*	1.260*	1.319	1.233	1.687***	1.421***
	(0.470)	(0.187)	(0.215)	(0.154)	(0.343)	(0.264)	(0.312)	(0.174)
Bordering countries	1.092	1.046	1.026	1.031	1.378	1.173	1.163	1.104
	(0.263)	(0.175)	(0.111)	(0.099)	(0.320)	(0.251)	(0.179)	(0.139)
Ethnic heterogeneity	47.650**	11.386**	7.457*	9.059**	3.830	2.540	22.934**	12.632**
	(78.724)	(11.846)	(8.718)	(9.196)	(7.768)	(4.158)	(34.358)	(15.516)
Religious heterogeneity	0.015***	0.082***	1.013	0.880	5.115	7.565	0.173	0.354
	(0.023)	(0.073)	(1.525)	(1.086)	(11.329)	(13.762)	(0.242)	(0.392)
Intrastate conflict	0.910	0.946	1.029	1.060	1.099	0.983	1.059	1.069
	(0.145)	(0.118)	(0.120)	(0.123)	(0.186)	(0.159)	(0.131)	(0.134)
Interstate conflict	1.088	0.858	1.197	0.995	0.725	0.662	0.985	0.982
	(0.206)	(0.293)	(0.159)	(0.223)	(0.216)	(0.271)	(0.254)	(0.388)
N	484	304	484	304	484	304	499	309

Table 1 continued

Dependent variable	FHPR		Amnesty scores		State Department scores		Physical integrity	
Length of time period	5 years	10 years	5 years	10 years	5 years	10 years	5 years	10 years
log(GDP per capita)	0.917	0.981	0.542***	0.582***	0.351***	0.330***	0.494***	0.495***
	(0.141)	(0.133)	(0.078)	(0.082)	(0.049)	(0.060)	(0.072)	(0.080)
log(Years of schooling)	1.805***	1.483**	2.319***	1.835***	4.111***	4.888***	2.344***	2.279***
	(0.327)	(0.250)	(0.465)	(0.345)	(0.805)	(1.383)	(0.495)	(0.523)
log(Resources rents)	0.945	0.961	1.119*	1.136**	1.243***	1.308***	1.287***	1.308***
	(0.066)	(0.063)	(0.073)	(0.066)	(0.074)	(0.102)	(0.067)	(0.079)
log(Population density)	1.118	1.155	1.069	1.094	1.283***	1.356**	1.264***	1.263**
	(0.112)	(0.124)	(0.109)	(0.101)	(0.118)	(0.166)	(0.109)	(0.128)
Bordering countries	0.833	0.863	1.258***	1.181**	1.300***	1.250**	1.218**	1.113
	(0.094)	(0.098)	(0.096)	(0.081)	(0.111)	(0.134)	(0.098)	(0.088)
Ethnic heterogeneity	2.729	2.368	0.435	0.593	1.516	1.367	0.831	0.491
	(1.914)	(1.686)	(0.364)	(0.438)	(1.284)	(1.292)	(0.529)	(0.337)
Religious heterogeneity	0.384	0.464	0.138***	0.216**	0.284	0.358	0.348	0.589
	(0.303)	(0.356)	(0.099)	(0.139)	(0.222)	(0.316)	(0.229)	(0.410)
Intrastate conflict	1.010	1.059	2.501***	2.453***	2.280***	2.583***	1.976***	1.889***
	(0.119)	(0.114)	(0.444)	(0.423)	(0.483)	(0.833)	(0.281)	(0.311)
Interstate conflict	1.051	0.750	1.204	1.193	1.133	1.883	1.191	1.438
	(0.141)	(0.157)	(0.281)	(0.322)	(0.221)	(1.015)	(0.289)	(0.522)
N	499	309	421	243	434	248	371	242

Random effects ordered logistic models; estimated thresholds omitted; reported coefficients are odds ratios; clustered standard errors in parentheses; significance levels: ***1%, **5%, *10%